

NEW SPECIES AND NEW RECORDS OF NORTH AMERICAN *PITYOPHTHORUS*
(COLEOPTERA: SCOLYTIDAE), PART V: THE JUGLANDIS GROUP

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ABSTRACT.— Five new species of Mexican *Pityophthorus* in the Juglandis group are described: *P. ablusus* (Hidalgo), *P. costifera* (Guerrero), *P. cracentis* (Morelos), *P. desultorius* (Puebla), and *P. insuctus* (Morelos). New locality or host records are given for *P. costabilis* Wood, *P. costatulus* Wood, and *P. diligens* Wood. Previously published keys are modified to accommodate these species.

This is the second contribution describing the unnamed species of *Pityophthorus* collected by Dr. T. H. Atkinson and his colleagues (Centro de Entomología y Acarología, Colegio de Postgraduados, Chapingo, Mexico). As in the previous paper (Great Basin Nat. 45:467–475), all the species in a species group are described together, and the key in my 1981 monograph (Mem. Ent. Soc. Canada 118:72) is modified to accommodate the newly named taxa.

I wish to thank Dr. T. H. Atkinson for sending the specimens to me and also thank him and his students for their diligence in searching for Scolytidae in previously unrecognized host plants. I also thank my colleagues Dr. Y. Bousquet and Dr. J. M. Campbell for reviewing the manuscript of this paper.

Pityophthorus ablusus, n. sp.

Length 1.4–1.7 mm, 3.2 times longer than wide.

FEMALE.— Frons convex, slightly to almost indeterminably flattened in median area extending to or above upper eye level; surface moderately shining with numerous, shallow, indefinite punctures and short, fine, scattered setae; epistoma with a very weak, blunt, median callus, this sometimes extended into a weakly elevated, longitudinal carina extending across flattened area. Antennal club oval, 1.5 times longer than wide, widest through segment 2; sutures 1 and 2 transverse, 1 heavily septate for almost entire length, 2 septate at lateral margins only; segments 1 and 2 together occupy two-thirds of total club length.

Pronotum 1.1 times longer than wide, widest at middle; sides parallel behind middle, slightly constricted and broadly rounded before middle; asperities on anterior slope arranged into three distinct concentric rows and 1 additional short, slightly irregular row around summit, asperities in each row distinct; summit distinctly elevated; posterior area weakly impressed behind summit, with large, distinct, moderately deep punctures, these separated by a distance nearly equal to diameter of puncture; surface between punctures moderately shining, marked with numerous fine lines and surface irregularities; median line not evident. Elytra almost 2.0 times longer than wide; apex narrowly rounded; discal striae punctured in regular rows, punctures large, moderately impressed, about equal in size and depth to those on posterior portion of pronotum; interstriae about 2.0 times wider than striae, surface impunctate, smooth, shining. Declivity sloping, weakly bisulcate; interstriae 1 moderately elevated, equal in height or slightly lower than 3, devoid of granules, with a few very fine punctures and setae; interstriae 2 weakly impressed, flat, broader than discal width, surface moderately shining with numerous fine lines and points; interstriae 3 weakly elevated, devoid of granules; punctures in striae 1 distinct but only very weakly impressed, those in 2 almost obsolete, much smaller than those on disc; interstriae 3, 5, 7 with a median row of several short setae.

MALE.— Frons moderately deeply, transversely concave on each side of median line; surface with slightly larger and deeper punctures.

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tures than on female, setae sparser. Pronotum as in female except punctures on posterior portion more distinct. Elytra and declivity similar to that of female.

TYPE MATERIAL.—The holotype (♀) is labeled: "Pachuca, Edo. Hgo., 21-V-82, S-461, 2400 m, Col. T. H. Atkinson"/"*Zexmenia* sp."/ "HOLOTYPE *Pityophthorus ablusus* Bright, CNC No. 18434." The allotype and 14 paratypes bear the same labels plus appropriate type labels; 7 additional paratypes bear the same data except that the collector is A. Equihua M.

The holotype, allotype, and 6 paratypes are in the Canadian National Collection, Ottawa (CNC), 2 paratypes were sent to S. L. Wood, Brigham Young University, Provo, Utah, and the remaining paratypes were returned to T. H. Atkinson.

COMMENTS.—Adults of this species are distinguished from those of *P. franseriae* Wood by the absence of granules in declivital interstriae 1 and 3, by the very weakly flattened female frons, by the male frons, which is concave on each side of a weakly elevated median line, and by the distributions.

Pityophthorus costifera, n. sp.

Length 1.2–1.4 mm, 2.4 times longer than wide.

Female.—Frons evenly, weakly convex; surface smooth, with small, shallow, evenly spaced punctures, these separated by distances equal to their diameters; pubescence sparse, nearly absent. Antennal club about 1.2 times longer than wide, widest through segment 2; sutures 1 and 2 transverse, straight, 1 distinctly septate, 2 septate only at lateral margins; segments 1 and 2 together occupy more than half of total club length. Pronotum as long as wide, widest at level of summit; anterior margin broadly rounded with a subserrate elevated costa; anterior slope bearing four elevated, evenly concentric, subserrate costae, these not divided into individual asperities, with one or two indistinct costae around summit; summit weakly elevated, distinct; posterior portion of disc distinctly, evenly punctured, punctures shallow, of moderate size, separated by distances about equal to their diameters; surface between punctures moderately shining, with numerous minute points; median line broad,

impunctate, not elevated. Elytra 1.5 times longer than wide; apex broadly rounded; discal striae punctured in regular rows, punctures small, shallowly impressed; discal interstriae about 2.0 times wider than striae, surface moderately shining, densely micro-punctate. Declivity very weakly impressed; interstriae 1 narrowly, weakly elevated, weakly impressed below elytral surface, with a median row of about four extremely small granules, each with a short, fine, erect seta at base; interstriae 2 very weakly flattened, essentially as on disc; interstriae 3 very weakly elevated, devoid of granules, with median row of short, fine erect setae; punctures in striae 1 and 2 obsolete, striae 1 narrowly impressed.

Male.—Very similar to female except frons less strongly convex, very weakly impressed above epistoma, with a low subtuberculate elevation at midpoint on epistoma, declivital setae very slightly stouter, declivital interstriae 3 with a median row of very fine granules, and striae 1 and 2 more conspicuously punctured on declivity.

TYPE MATERIAL.—The holotype (♀) is labeled: "Taxco, Guerrero, 22.II.82, S326, 1900 msnm, col. Atkinson y Equihua"/"Apocynaceae"/♀/"HOLOTYPE *Pityophthorus costifera*, D. E. Bright, 1985, CNC No. 18420." The allotype and six paratypes bear the same data plus appropriate type labels. One specimen, thought to be this species but not designated as a paratype, is labeled: "Chilapa, Guerrero, 23.II.83, S-344, 1640 msnm, col. Atkinson y Equihua." Eight additional paratypes are labeled: "Cuautla, Morelos, 1 Oct-82, 1230 m, SM-119, E. Saucedo—A. Burgos"/"(Apocynaceae) *Thevetia peruviana*" and a paratype label.

The holotype, allotype, and 6 paratypes are in the CNC, 6 paratypes were returned to T. H. Atkinson, and 2 paratypes were sent to S. L. Wood.

COMMENTS.—This species is closely related to *P. costatulus* Wood but differs by its larger size, by the very different female frons as indicated below, and by the very weakly impressed elytral declivity.

Pityophthorus cracentis, n. sp.

Length 1.1–1.2 mm, 3.3 times longer than wide.

FEMALE.—Frons flattened on a small area extending from epistomal margin to well above eyes, flattened area laterally occupying about 60% of distance between eyes; surface of flattened area densely, minutely punctured, with moderately long, erect, yellowish setae, these longer on upper portion, becoming progressively shorter toward epistoma; surface above and lateral to flattened area smooth, shining, glabrous, with a few widely separated, small punctures. Antennal club small, about 1.2 times longer than wide, widest through segment 2; sutures 1 and 2 transverse, lightly septate at lateral margins, 1 more strongly septate than 2; segments 1 and 2 together occupy about two-thirds of total club length. Pronotum less than 1.1 times longer than wide, widest at middle; sides very slightly converging behind middle, broadly rounded before middle; asperities on anterior slope arranged into four definite, regular, concentric rows, fourth row small, placed around summit, asperities in each row distinct; summit weakly elevated; posterior area with widely separated, small, very shallow punctures; surface between punctures smooth, shining to very finely reticulate; median line evident as a narrow, weakly elevated line extending from summit to posterior margin. Elytra about 1.5 times longer than wide; apex broadly rounded; discal striae punctured in regular rows, punctures large, distinctly but shallowly impressed, these much larger, deeper than those on posterior portion of pronotum, each puncture with an extremely short seta equal to or slightly longer than diameter of puncture; discal interstriae shining, about 1.5 times wider than striae, surface impunctate, marked with extremely fine lines. Declivity steep, weakly bisulcate; interstriae 1 weakly elevated, slightly impressed below level of 3 on upper half, each interstriae with 1 small, acute granule near apex; interstriae 2 weakly bisulcate, shining, glabrous; interstriae 3 slightly elevated above 1, with a median row of 3 small but distinct, acute granules, middle granule larger than other two; remaining interstriae unmodified with a few, long, erect setae.

TYPE MATERIAL.—The holotype (♀) is labeled: "Carr. Xochicalco—Cuentepec, Km. 6, Temixco, Mor., 14-Julio-84, 1220 m, SM-347, E. Saucedo—E. Martinez"/"Composi-

tae"/"HOLOTYPE *Pityophthorus cracentis* D. E. Bright, 1985, CNC No. 18430." Four female paratypes bear the same labels plus appropriate paratype labels.

The holotype and 1 paratype are in the CNC, the remaining 3 paratypes have been returned to T. H. Atkinson.

COMMENTS.—This species seems to be unique among the *Pityophthorus* known to me. Adults differ from the other species in the *Juglandis* group by the distinctly but slightly impressed elytral declivity. It cannot be placed in the *Scriptor* group since the elytral apex is not acuminate, and it doesn't fit at all in the other species groups with concentric rows of pronotal asperities. However, to avoid creating monotypic species groups unless absolutely necessary, I have broadened the concept of the *Juglandis* group to include this species.

Pityophthorus desultorius, n. sp.

Length 1.2–1.4 mm, 2.8 times longer than wide.

FEMALE.—Frons flattened on a small area extending from epistomal margin to upper level of eyes, with a weakly elevated, impunctate, longitudinal carina extending from epistoma to upper margin of flattened area, flattened area laterally occupying about 60% of the distance between eyes; surface on each side of carina shining, with distinct small, shallowly impressed punctures and with short, scattered, inconspicuous setae. Antennal club circular, as long as wide, widest through segment 2; sutures 1 and 2 transverse, straight, septate at lateral margins; segments 1 and 2 together occupy about two-thirds of total club length. Pronotum 1.1 times longer than wide, widest at level between summit and posterior margin; asperities arranged into three or four irregular rows, these especially irregular on median portion, rows more regular on lateral areas; summit weakly elevated; posterior portion of disc moderately shining, with large, deep punctures, these separated by distances much less than their own diameters; surface between punctures with extremely fine lines and points; median line flat, broad, impunctate. Elytra 1.2 times longer than wide; apex broadly rounded; discal striae punctured in distinct, regular rows,

punctures about same size and depth as those on posterior portion of pronotum, each puncture bearing a very short seta equal to or slightly longer than diameter of puncture; discal interstriae moderately shining, equal in width or slightly narrower than striae, surface impunctate, moderately shining with very fine points and lines. Declivity steep, almost evenly convex, very weakly bisulcate; interstriae 1 weakly elevated, devoid of granules; interstriae 2 very weakly impressed, moderately shining; interstriae 3 convex, not elevated, equal in height to 1, devoid of granules; punctures in striae 1 and 2 not visible; interstriae 1, 3, 5, 7, each with a median row of narrowly spatulate setae.

MALE.—Almost identical to female, differs by frons more distinctly convex, setae shorter and sparser.

TYPE MATERIAL.—The holotype (♀) is labeled: "Oriental, Pue., 4.V.81, 2370 m, col. T. H. Atkinson, A. Equihua, S-213"/"Hosp.: Compositae"/"HOLOTYPE *Pityophthorus desultorius*, D. E. Bright, 1985, CNC No. 18421." The allotype and 10 paratypes bear the same labels plus appropriate type labels.

The holotype, allotype, and 4 paratypes are in the CNC, four paratypes were returned to T. H. Atkinson, and 2 paratypes were sent to S. L. Wood.

COMMENTS.—Adults of this species are similar to those of *P. insuetus* (described below) but differ by the larger, deeper punctures on the posterior portion of the pronotum, by the steeper, more convex elytral declivity, and by the slightly smaller size.

Pityophthorus insuetus, n. sp.

Length 1.5–1.8 mm, 3.1 times longer than wide.

FEMALE.—Frons convex, very weakly flattened, with a distinct, weakly elevated longitudinal carina extending from epistoma to above upper level of eyes; surface on each side of carina shining, with densely placed, weakly impressed punctures; pubescence sparse, erect, consisting of short, scattered, erect setae, these longer along epistomal margin. Antennal club oval, about 1.5 times longer than wide, widest through segments 1 and 2; sutures 1 and 2 transverse, 1 more distinctly septate; segments 1 and 2 together occupy

more than half of total club length. Pronotum about 1.1 times longer than wide, widest slightly behind level of summit; asperities arranged into four irregular concentric rows, these especially irregular in median portion of first two rows, these first two rows more even laterally, rows around summit more even, regular; summit weakly elevated; posterior portion of disc shining, punctures moderate, deep, very close, these separated by less than diameter of puncture; surface between punctures with very finely impressed, minute points; median line weakly elevated, smooth, impunctate. Elytra 2.0 times longer than wide; apex narrowly rounded; discal striae punctured in distinct regular rows, punctures distinctly, moderately impressed, each with a seta slightly longer than diameter of puncture, punctures slightly smaller than those on posterior portion of pronotum; discal interstriae smooth, equal in width or slightly narrower than striae, impunctate. Declivity convex, weakly bisulcate; interstriae 1 weakly elevated, weakly impressed below level of interstriae 3, devoid of granules; interstriae 2 very weakly impressed, flattened, shining, equal in width to discal width; interstriae 3 very weakly elevated above interstriae 1 and 2, devoid of granules; punctures in striae 1 and 2 moderately distinct, much smaller than those on disc, striae 1 narrowly impressed; interstriae 1, 3, 5, 7 each with median row of sparse, erect setae.

MALE.—Very similar to female except frons more deeply, densely punctured, median carina slightly more strongly elevated, declivity slightly more deeply bisulcate, setae on posterior portion of elytral interstriae narrowly flattened or narrowly spatulate.

TYPE MATERIAL.—The holotype (♀) bears the labels: "Huitzilac, MOR., 25-IX-81, 2700 m, S252, Col. Atkinson—Equihua"/"Hosp.: Compositae"/"HOLOTYPE *Pityophthorus insuetus* D. E. Bright 1985, CNC No. 18422." The allotype and 15 paratypes bear the same data plus appropriate type labels.

The holotype, allotype, and 6 paratypes are in the CNC. 7 paratypes were returned to T. H. Atkinson, and 2 paratypes were sent to S. L. Wood.

COMMENTS.—This species does not appear to be very closely related to any species in the

Juglandis group but is similar to *P. desultorius*. It will key out in my 1981 key to *P. detentus* Wood but differs by the sparsely pubescent female frons (densely pubescent in *P. detentus*), by the more deeply impressed elytral declivity, by the more distinct strial punctures in striae 1 and 2 on the declivity, and by the irregular concentric rows of asperities on the pronotum (very evenly concentric in *P. detentus*). Adults differ from those of *P. desultorius* by the characters mentioned below.

REVISED KEY TO SPECIES IN THE JUGLANDIS GROUP

1. Anterior slope of pronotum bearing 4 or more concentric, continuous costae, the summit of each costa subserrate, individual asperities not detectable; female frons flattened to weakly concave, pubescence short; male frons convex, distinctly punctured, devoid of carina; posterior portion of pronotum with numerous impressed points on surface between punctures 2
- Anterior slope of pronotum with asperities arranged in several concentric rows, each row strongly serrate, divided to or near their bases, individual asperities usually detectable; female and male frons variable but not as above; surface between punctures on posterior portion of pronotum smooth and shining or reticulate 4
- 2(1). Sutures of antennal club straight to moderately procurved; declivital striae 1 and 2 finely punctured in both sexes; interstriae 2 weakly impressed on declivity in female; male frons subglabrous 3
- Sutures of antennal club strongly procurved; declivital striae 1 and 2 rather coarsely punctured in female, interstriae 2 more strongly impressed on declivity in female; male frons pubescent near epistoma; body length 1.6–1.8 mm; Jalisco, Guerrero *costabilis* Wood
- 3(2). Female frons flattened with moderately abundant, long, erect, equal length setae evenly scattered over surface; declivity not impressed, declivital interstriae 1 and 3 with median row of fine granules in both sexes; body length 0.9–1.2 mm; Jalisco, Oaxaca *costatulus* Wood
- Female frons convex, setae absent or very sparse, inconspicuous; declivity very weakly impressed, declivital interstriae 3 devoid of granules in female, granules distinct but very small in declivital interstriae 1 and 3 in male; body length 1.2–1.4 mm; Guerrero, Morelos *costifera* Bright
- 4(1). All declivital interstriae (except 2 and rarely 6) with a median row of short setae 5
- Declivital interstriae 1, 3, 5, 7 with a median row of short setae 8
- 5(4). Pronotum evenly arched from base to anterior margin, pronotal summit not elevated and transverse impression not present; pronotal asperities arranged in up to 8 broken concentric rows; interstriae 1 on declivity impressed below level of interstriae 3; Guatemala *tenax* Wood
- Pronotum with a definitely elevated (sometimes weak) pronotal summit and with a transverse impression behind summit; pronotal asperities arranged in 3–5 even, concentric rows; declivity variable 6
- 6(5). Declivital interstriae 3 with small but distinct granules; declivital setae scalelike in male, hairlike in female; Costa Rica *galerius* Wood
- Declivital interstriae 3 devoid of granules; if present, granules extremely minute; declivital setae hairlike in both sexes 7

- 7(6). Antennal club elongate-oval, more than 1.4 times longer than wide; female frons flattened on a very large semicircular area extending far above upper level of eyes, pubescence dense and long on periphery, sparser in central area, male frons flattened on a smaller area, pubescent but pubescence much less dense than on female; Mexico. *burserae* Wood
- Antennal club oval, 1.4 times or less longer than wide; female frons convex, pubescence short, male frons weakly, transversely impressed, punctured, Costa Rica. *strictus* Wood
- 8(4). Declivital interstriae 3 higher than 1. 9
- Declivital interstriae 3 equal in height to 1 or lower 11
- 9(8). Interstriae 1 on elytral declivity distinctly impressed below level of interstriae 3, with one, small, acute granule near apex; interstriae 3 distinctly elevated, with three larger, acute granules; female frons flattened, pubescent on small median area; body very slender, about 3.3 times longer than wide; Morelos. *cracensis* Bright
- Interstriae 1 on elytral declivity only very slightly impressed below level of interstriae 3, with or without a median row of numerous small granules; interstriae 3 weakly elevated, with or without a median row of numerous small granules; body stouter, 3.0 or less times longer than wide 10
- 10(9). Pronotal asperities arranged into three concentric rows (vague 4th row infrequently seen); declivital interstriae 3 devoid of granules in both sexes or granules extremely fine; female frons pubescent over entire surface, setae short, of equal length; declivity steep, interstriae 3 only slightly higher than 1; Mexico. *diligens* Wood
- Pronotal asperities arranged in four or more definite concentric rows; declivital interstriae 3 of male with distinct granules, female devoid of granules; female frons densely pubescent only on lower portion below upper level of eyes, setae long, dense, extending at least to midpoint of mandibles; declivity sloping, interstriae 3 slightly but definitely higher than 1; Mexico. *nanus* Wood
- 11(8). Antennal club with only one suture septate; declivity evenly convex; male frons strongly convex, surface dull, minutely reticulate, impunctate; Mexico. *indigenus* Wood
- Antennal club with two sutures septate; declivity evenly convex to weakly impressed; male frons weakly convex, transversely impressed or broadly flattened, surface punctured 12
- 12(11). Declivital interstriae 2 weakly impressed, below level of 3. 13
- Declivital interstriae 2 not impressed, equal in height to 3. 14
- 13(12). Declivital interstriae 1 and 3 devoid of granules; declivity sloping; female frons very weakly flattened, male frons concave on each side of weakly elevated median line; Hidalgo. *ablusus* Bright
- Declivital interstriae 1 and 3 with a median row of fine granules; declivity more steeply convex; female frons distinctly flattened, male frons transversely impressed, with transverse carina at upper level of eyes; New Mexico. *franseriae* Wood
- 14(12). Elytral declivity strongly, evenly convex, punctures in striae 1 and 2 distinct; serrations on anterior margin of pronotum located in median area only; pronotal asperities in broken concentric rows; female frons flattened to well above eyes, setae on upper margin very long, masking surface; Mexico. *pudicus* Blackman

- Elytral declivity less strongly convex to flattened, punctures in striae 1 and 2 indistinct to obsolete; serrations on anterior margin of pronotum more generally located, extending to lateral margin; pronotal asperities in even to slightly broken concentric rows; female frons variable but not as above 15
- 15(14). Body length 1.7–2.0 mm; declivital interstriae 1 and 3 each with a row of small granules in male; concentric rows of pronotal asperities usually somewhat irregular; southwestern United States *juglandis* Blackman
- Body length 1.2–1.8 mm; declivital interstriae 1 and 3 devoid of granules in both sexes; pronotal asperities arranged in regular to irregular concentric rows; Mexico 16
- 16(15). Pronotal asperities in regular, even rows; punctures in striae 1 and 2 obsolete on declivity; declivity evenly convex; female frons flattened, with long setae *detentus* Wood
- Pronotal asperities irregular in median portion, more even laterally; punctures in striae 1 and 2 visible, smaller than those on disc; declivity weakly bisulcate to almost evenly convex; female frons convex, with short, sparse setae 17
- 17(16). Declivity sloping, weakly bisulcate, more deeply impressed in male; punctures on posterior portion of pronotal disc moderate in size, deeply impressed; body length 1.5–1.8 mm *insuetus* Bright
- Declivity steeper, almost evenly convex in both sexes; punctures on posterior portion of pronotal disc larger, more deeply impressed; body length 1.2–1.4 mm *desultorius* Bright

NEW RECORDS

Pityophthorus costabilis Wood

Pityophthorus costabilis Wood, 1976, Great Basin Nat. 36:352; Bright, 1981, Mem. Ent. Soc. Canada 188, p. 74; Wood, 1982, Great Basin Nat. Mem. 6:1121.

This species was previously known from eight specimens from Jalisco. A series of 19 specimens that are probably this species were seen with the labels: "Chilapa, Guerrero, 23.II.82, S-344, 1640 msnm, Col. Atkinson y Equihua."

When this species was named, the frons of the females was undescribed because it was largely concealed on the available specimens. The discovery of additional specimens enable the following comments to be made.

The female frons is broadly flattened, weakly plano-concave on a large area extending well above eyes, with very dense, minute punctures and dense, erect, moderately long setae that are shorter in the center and longer and incurved on the periphery. The size of specimens is given in the original description as 1.6–1.8 mm. The additional specimens at hand range in size from 1.4 to 1.8 mm.

Pityophthorus costatulus Wood

Pityophthorus costatulus Wood, 1976, Great Basin Nat. 26, p. 351; Bright, 1981, Mem. Ent. Soc. Canada 118:73; Wood, 1982, Great Basin Nat. Mem. 6:1120.

This species was previously known from Jalisco and Oaxaca from *Thevetia* sp. A series of seven specimens bearing the labels: "Chilapa, Guerrero, 23.II.82, S-344, 1640 msnm, col. Atkinson y Equihua" and a series of seven specimens labeled: "Cuauhtenango, GRO., 23.II.82, S-344, Atkinson-Equihua" were seen.

Pityophthorus diligens Wood

Pityophthorus diligens Wood, 1976, Great Basin Nat. 36:363; Bright, 1981, Mem. Ent. Soc. Canada 188:77; Wood, 1982, Great Basin Nat. Mem. 6:1132.

This species was previously known only from Hidalgo from a desert shrub with bluish leaves. Mixed in a series of 25 specimens of *P. ablusus* was one specimen that is probably this species. It bears the labels: "Pachuca, Edo. de Hidalgo, S-461, 21.V.82, 2400 m, col. A. Equihua M"/"Zexmenia sp. (Compositae)."